

GI General Instrument

Operator's Guide

**DSR-1500
DigiCipherTM**

**Commercial
Receiver/Decoder**



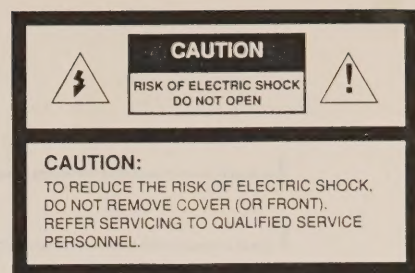
WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.

The lightning flash with the arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

This installation should be made by a qualified service person.



ATTENTION

This commercial unit is intended for the decoding of VideoCipher® and DigiCipher™ television signals for commercial use. Possession of this device does not enable or entitle the possessor to receive VideoCipher or DigiCipher television signals. Contact program providers to obtain appropriate authorizations.

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Covered under one or more U.S. Patents 4,608,456, 4,613,901, 4,634,808, 4,712,238, 4,792,973, 4,864,615, 4,933,898, 5,068,724, 5,083,293, 5,111,504, 5,144,664 and patents pending.

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AC-2 digital audio system manufactured under license from Dolby Laboratories Licensing Corporation.

WARNING

The unauthorized modification of any decoder and the sale and use of any such decoder is prohibited by law. Any such modification or alteration of this product or any unauthorized reception of television programming could subject the user and/or seller and/or party modifying the decoder to fines, imprisonment, and civil damages.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. This digital apparatus does not exceed the Class A limits of radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

MULTIPLE VOLTAGE EQUIPMENT:

The power cord included with your DSR-1500 is for use with standard 125 VAC supplies. If it is necessary to operate the product in the U.S.A. with a 220 VAC supply, then a UL LISTED power cord type SJT with a NEM 6-15P plug must be used.

REPAIRS AND ASSISTANCE:

For assistance on setup, operation, return or repair see Appendix A.

Before returning the IRD to General Instrument for repair or return, read Appendix A.

NOTE TO CATV SYSTEM INSTALLER:

This reminder is provided to call the CATV system installer's attention to Article 820-40 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

WARNING:

To prevent electrical shock, do not use the receiver electrical power plug (polarized) with an extension cord, receptacle, or other outlet unless the blades can be fully inserted to prevent blade exposure.

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Quick Install

This sheet provides at-a-glance instructions for installing a single DSR-1500 DigiCipher Commercial IRD. For detailed instructions on performing this procedure, or for multiple-receiver installation, refer to Chapter 3 of this IRD Operator's Guide.

To install a single IRD for use, do the following:

1. Unpack receiver. Do not overlook power cord, handles, and adapters (when applicable) in foam packaging. Ensure the 403MHz. IF Loop Through is firmly seated on the rear panel connectors.
2. Rack mount receiver. Do not block air ventilation on top and bottom.
3. Determine the satellite, transponder, and DigiCipher channel for which the receiver will be used.
4. Connect the L-Band (950-1450 MHz) LNB Coax cables to Port 0 and/or Port 1. For easiest setup, use Port 0 for H; use Port 1 for V.
5. Connect NTSC OSD OUT to a local monitor.
6. Connect the power cable and plug it into a power source.
7. From the front panel INPUT Menu, configure the appropriate port for the satellite you're using. You must be sure the H/V selection matches the connection to the port; if the vertically polarized signal is connected to port 0, use this menu to select port 0 as "V", and similarly for horizontal polarization. From the front panel MAIN Menu, select transponder (and digital channel if DigiCipher format).
8. Check the front panel to verify that either the DigiCipher or VideoCipher indicator is lit.
9. With receiver power on contact your program provider with the unit address listed on the back panel for authorization. The authorization indicator must light to indicate the message was received and the receiver is authorized.
10. Remove power, make video connections from NTSC NO OSD to modulator.
11. Make audio connections. For primary stereo, connect pins R1(+) / R1(-) to the right audio input terminals on the channel modulator and L1(+) / L1(-) to the left audio inputs on the channel modulator.
12. Restore power.

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Chapter 1

Introducing the DSR-1500

About This Manual

This manual is written for operating technicians of the DigiCipher DSR-1500 commercial satellite Integrated Receiver/Decoder. The manual is divided into four main sections and three appendices:

Chapter 1 introduces the IRD and describes the layout of this manual. Included are a general description and technical specifications of the IRD receiver.

Chapter 2 provides step by step instructions for installing the IRD and describes the rear panel connectors. It also tells you how to change the decoder battery and renew access security with a TvPass™ Card.

Chapter 3 describes the front panel LCD/keypad interface and provides detailed information on each of the menus, fields, and options displayed on the front panel LCD.

Chapter 4 provides troubleshooting information including a list of symptoms and their recommended actions.

Appendix A explains what to do when you need to return your receiver to the factory for any reason.

Appendix B provides downlink/L-band frequency conversion tables.

Appendix C explains the diagnostic codes that may be displayed using the front panel on-screen display option.

What is the DSR-1500?

The General Instrument DSR-1500 digital satellite receiver is an Integrated Receiver/Decoder (IRD) designed for use by cable operators and other commercial satellite operations.

The DSR-1500 design provides maximum flexibility to the operator by processing three satellite-delivered signal formats: DigiCipher, VideoCipher II PLUS, and clear (unscrambled) NTSC.

The DigiCipher signal is an all-digital compressed format. Currently, it provides up to ten television (channels) per transponder when configured by the program provider. In the DigiCipher format, video and up to four audio channels are transmitted digitally and then decoded and provided to the user in standard analog format compatible with existing cable equipment. The digital format provides clear, clean video and audio.

The VideoCipher II PLUS format, consisting of scrambled analog video and encrypted digital audio, and the clear NTSC format, with unscrambled analog video and audio, are also processed by the IRD. The IRD determines the received format and automatically selects the processing needed to supply the outputs to cable equipment through a common set of connections.

The IRD contains a 950 to 1450 MHz RF tuner, power supply, DigiCipher Decoder, a microprocessor control circuit, and other supporting circuits such as audio/video processor circuits and L-band loop through circuits.

The front panel provides visual status of IRD operation by LED indicators and LCD display. Dedicated LED indicators show status for the following functions: Authorized, VideoCipher Sync., DigiCipher Sync., Manual Mode, active input port, and relays energized. A Liquid Crystal Display (LCD) indicates other status parameters such as transponder and channel number, satellite name, polarization, C/Ku band, audio status, audio gain, and signal level/quality. This display is used in conjunction with front panel keys to configure the unit.

The rear panel provides audio/video connections, auxiliary data outputs, battery access, and other connections such as power input. It contains two phone cable type connectors for a multi-drop system. These connectors will allow a properly configured microcomputer to communicate with the receiver microprocessor as part of a site management system. *This is not a modem. Do not connect to standard telephone lines.*

DSR-1500 DigiCipher Commercial IRD

Specifications

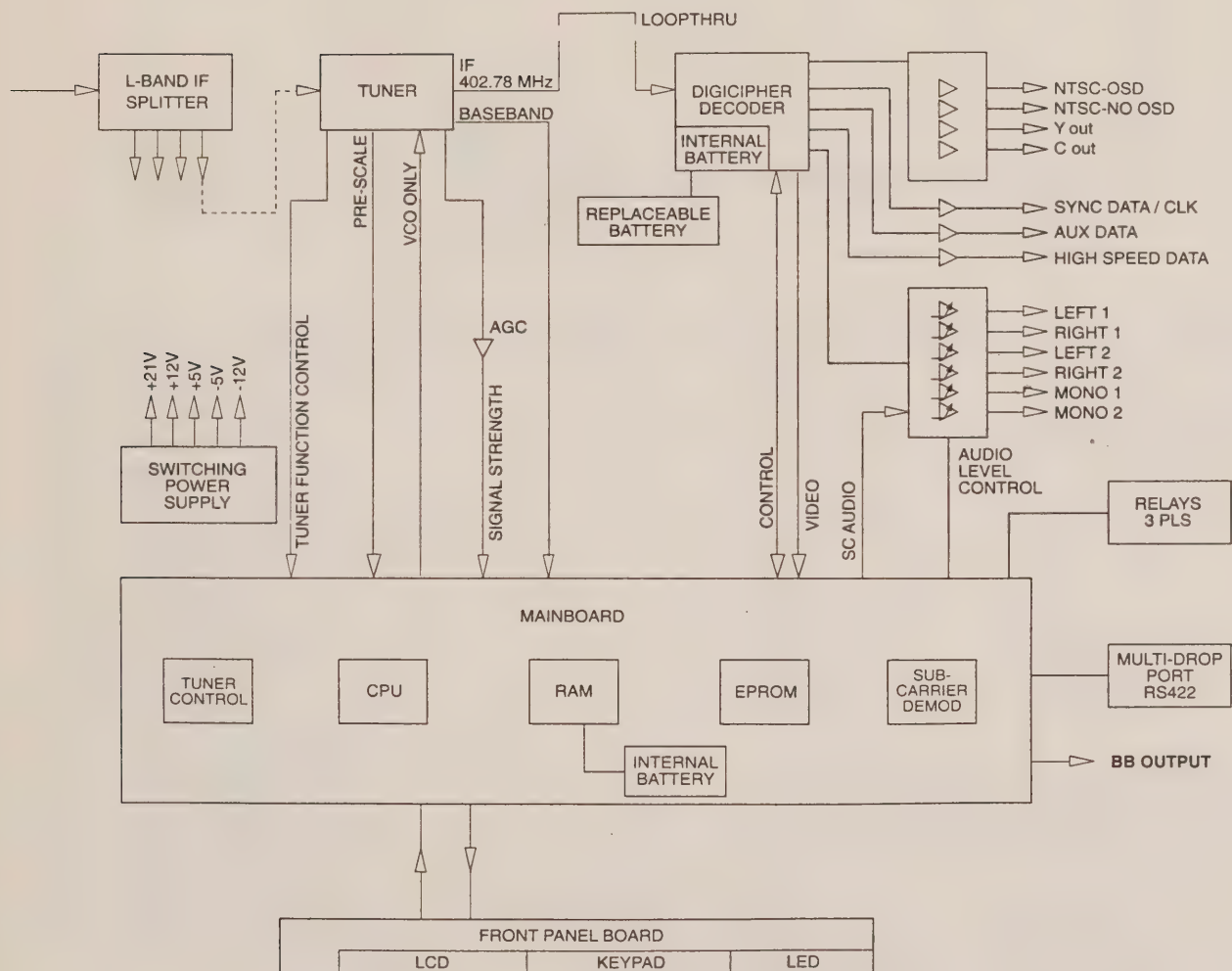
RF	
Input Frequency Range	950 - 1450 MHz, C/Ku switchable
Input Level Range	-65 to -25 dBm
RF Port Impedence	75 Ohms
Return Loss	8 dB worst case
Port to port isolation	40 dB minimum
VIDEO	
Frequency Response (Composite, Component Y, and OSD)*	± 0.6 dB (DC to 4.2 MHz)
Frequency Response BB Output**	10 KHz - 8.5 MHz
Chrominance-Luminance Delay Inequality	± 40 nsec (Composite only)
Differential Gain	3.4% p-p maximum (10 to 90% APL)
Differential Phase	3.4° p-p maximum (10 to 90% APL)
Signal-to-Noise Ratio	57 dB Luminance weighted
Signal Types	QPSK DigiCipher, VideoCipher II+, Clear NTSC
AUDIO	
Output Level	+16.0 dBm ± 0.1 dB into 600 Ohms, Attenuation Adjustable (0 to -14 dB)
Frequency Response	± 0.6 dB, 20 Hz to 20 kHz
Total Harmonic Distortion	0.4% or better at 1kHz RE : +10dBm
S/N	88 dB or better at 1 kHz RE : +16 dBm measured at 1 kHz
Isolation	80 dB, 20 - 20 kHz
Impedance	600 ohms ± 2%, Balanced
Mono Level Balance	± 0.25 dB TYP.
ELECTRICAL/MECHANICAL	
Power Requirements	100 to 250 VAC, 47/63 Hz, 70 W
LNB Power Supply	16 V minimum, 480 mA loaded
Connectors:	
RF In	F-Type
Video Out	BNC
Audio	Screw Terminal on Quick Disconnect Plug
Auxiliary Data	Screw Terminal on Quick Disconnect Plug
High Speed Data	Screw Terminal on Quick Disconnect Plug
Relay Contacts	Screw Terminal on Quick Disconnect Plug
Dimensions	H 3.5" (8.9cm) x W 19.0" (48.3cm) x D 18.0" (45.7cm)
Weight with Decoder	19 lb (6.6 kg)

* The DigiCipher Commercial IRD meets the above video specifications for the composite video output when operating with a signal supplied by a component test generator (TSG1000) to a DigiCipher Encoder, at an IRD ambient temperature of 25°C with the input static test signal applied to all encoder channels simultaneously, and the encoder to MHz output translated to the IRD input frequency (noise free). Refer to NTC7 for measurement methods. These specifications do not apply to the Composite Video with OSD output.

** This is intended for external audio subcarrier demodulators; specification applies in clear mode.

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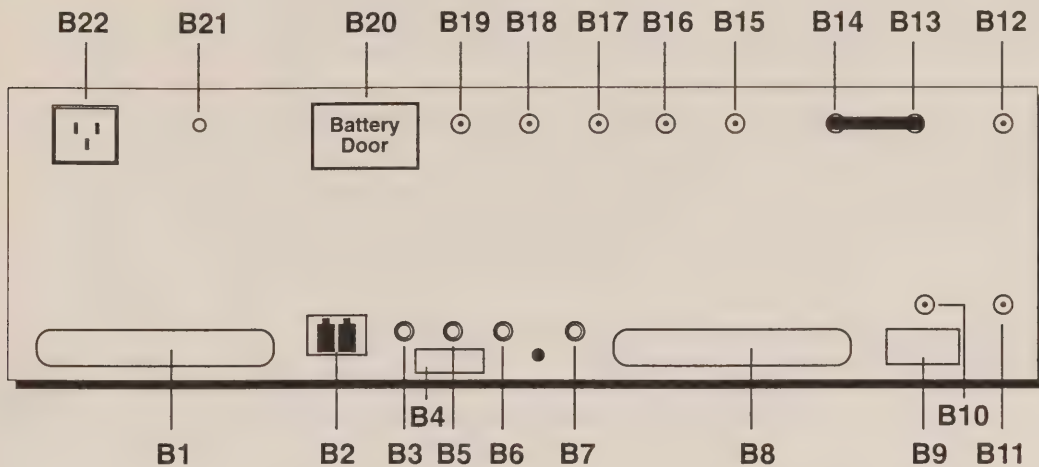
Figure 1-1 is a functional block diagram of the IRD showing signal flows. The tuner selects one of two IF inputs (typically one horizontal and one vertical polarization) and mixes this signal down to a 402.78 MHz IF and a baseband. The DigiCipher Decoder demodulates the 402.78 MHz IF to produce four audio (left1, right1, left2, right2) and four video (NTSC, NTSC with OSD, Y, C) signals. The baseband signal is used to generate VCII Plus, Clear Video, and subcarrier audio signals. The video signals are then buffered through the rear panel board. The audio signals are processed to produce the differential outputs and the two additional mono channels.



Chapter 2

Installing the DSR-1500

Figure 2-1 illustrates the rear panel of the DSR-1500 satellite receiver. This is where all cable connectors reside.



- B1. Data and relay quick disconnect screw terminals.
- B2. Remote for PC network only.
- B3. Video (Y out)
- B4. Unit Address label
- B5. Video (C out)
- B6. Video (NTSC OSD)
- B7. Video (NTSC NO OSD)
- B8. Audio quick disconnect screw terminal.
- B9. Unit Serial Number label.
- B10. BB Output
- B11. Tuner input port 1.
- B12. Tuner input port 0.
- B13. IF loop out.
- B14. IF loop in.
- B15. L Band splitter output 4.
- B16. L Band splitter output 3.
- B17. L Band splitter input.
- B18. L Band splitter output 2.
- B19. L Band splitter output 1.
- B20. Battery access.
- B21. Circuit breaker.
- B22. Universal power input
100-250VAC (47Hz-63Hz)

DATA AND RELAY QUICK DISCONNECT SCREW TERMINALS (B1)

Summary Alarm	Relay 0	Relay 1	Aux. Data	Sync. Data	HS Data
1 2 3	4 5 6	7 8 9	10 11 12	13 14 15 16	17 18 19

- Alarm
 - 1. Relay 0 N/O
 - 2. Relay 0 COM
 - 3. N/C
- Relay 0
 - 4. Relay 0 N/O
 - 5. Relay 0 COM
 - 6. Relay 0 N/C
- Relay 1
 - 7. Relay 1 N/O
 - 8. Relay 1 Comm
 - 9. Relay 1 N/C
- 10. Aux
- 11. Aux
- 12. Aux Data GND
- 13. TX
- 14. TX
- 15. CLK
- 16. CLK
- 17. HS Data GND
- 18. HS Data +
- 19. HS Data -

AUDIO QUICK DISCONNECT SCREW TERMINAL (B7)

18 17 16	15 14 13	12 11 10	9 8 7	6 5 4	3 2 1
----------	----------	----------	-------	-------	-------

- 1. LEFT 1 GND
- 2. LEFT 1-
- 3. LEFT 1+
- 4. MONO 1 GND
- 5. MONO 1-
- 6. MONO 1+
- 7. RIGHT 1 GND
- 8. RIGHT 1-
- 9. RIGHT 1+
- 10. LEFT 2 GND
- 11. LEFT 2-
- 12. LEFT 2+
- 13. MONO 2 GND
- 14. MONO 2-
- 15. MONO 2+
- 16. RIGHT 2 GND
- 17. RIGHT 2-
- 18. RIGHT 2+

Figure 2-1: Rear Panel Connectors

Unpacking and Mounting

When you first receive your IRD, unpack it from the shipping carton. This should contain the receiver, a power cord, front panel handles with hardware, and this Operator's Guide. International versions may also include a power cord adaptor. When unpacking the equipment, **please check foam packing caps for handles, handle hardware, and other items. Ensure the 403 MHz Loop Through is fully seated on the rear panel connectors.** Once you locate all of the pieces indicated, install the front panel handles with the hardware provided.

The IRD is designed for installation in a standard 19 inch equipment rack. If you plan to mount the receiver in a rack, be sure to use pan or round head screws and washers **in all four** front panel mounting locations when attaching to the rack. This ensures a secure mount due to the size and weight of the IRD.

Also be sure to provide adequate ventilation for longest receiver life. For instance, do not set the receiver on a table top or otherwise block airflow from the top or bottom of the chassis.

Optionally, you can use an alternative slide mounting. The IRD chassis is designed to accept side mounted slides.

Single Receiver Installation

To install one IRD for use, do the following:

1. Determine the satellite, transponder, and DigiCipher channel for which the receiver will be used.
2. Connect the L-Band (950-1450 MHz) LNB Coax cable, horizontal or vertical, to either Port 0 or Port 1. For dual LNB, connect the coax to both Port 0 and Port 1. If the vertical polarization is connected to Port 1, configuration setup will be minimized.
3. To allow system operators to view video and on screen diagnostics for setup and troubleshooting, connect NTSC OSD OUT on the IRD to a video monitor. Turn monitor on.
4. Connect the power cable and plug it into a power source.
5. From the Main Menu, press the down arrow on the front panel keypad twice to go into the INPUT Menu. From the INPUT Menu, configure the appropriate port for the satellite you're using. Refer to Chapter 3, INPUT Menu for instructions on performing this task.
6. Return to the MAIN Menu and verify that the satellite you've configured is listed in the Satellite field. Change transponder and channels as desired.
7. Check the front panel to verify that the appropriate indicators are lit. "DigiCipher" indicates you have locked with (have sync with) digital signals, "VideoCipher" indicates you have sync with VideoCipher II/II PLUS analog signals.

After you have sync, contact your program provider with the unit address listed on the back panel. Leave the receiver powered on and synchronized to obtain an authorization message from satellite signals. The "Authorized" indicator will light when you are authorized to receive signals through the receiver.

If you fail to receive authorization status (i.e., if the LED remains off), recheck the above steps and contact your program provider again for a second authorization message. If this fails to authorize the receiver, refer to Chapter 4 of this manual for troubleshooting advice. If your efforts are still unsuccessful, contact the General Instrument hotline listed in Appendix A.

8. Remove power.
9. Make video connections. Connect NTSC NO OSD OUT on the IRD to the channel modulator video input jack.
10. Make audio connections. Since all audio outputs on the IRD are differential pairs, we recommend two pair shielded audio cable for audio connections.

For primary stereo, connect pins R1(+) / R1(-) to the right audio input terminals on the channel modulator and L1(+) / L1(-) to the left audio inputs on the channel modulator. If secondary audio stereo is to be used in your site, connect R2(+) / R2(-) to the right audio input terminals on the secondary modulator and L2(+) / L2(-) to the left audio input terminals on the secondary modulator.

For mono, connect pins M1(+) / M1(-) to the audio input terminals on the channel modulator. If secondary audio mono is to be used in your site, connect M2(+) / M2(-) to mono inputs on the channel modulator secondary audio program.

Ground all shields to the ground (GND) terminals provided on the IRD and on the channel modulator.

11. Modify video finetuning and audio levels if necessary. (Note that video finetuning is automatically set by the receiver in DigiCipher mode.)

Multiple Receiver Installation

To install multiple IRD receivers using the same dish antenna signals, refer to the following figure.

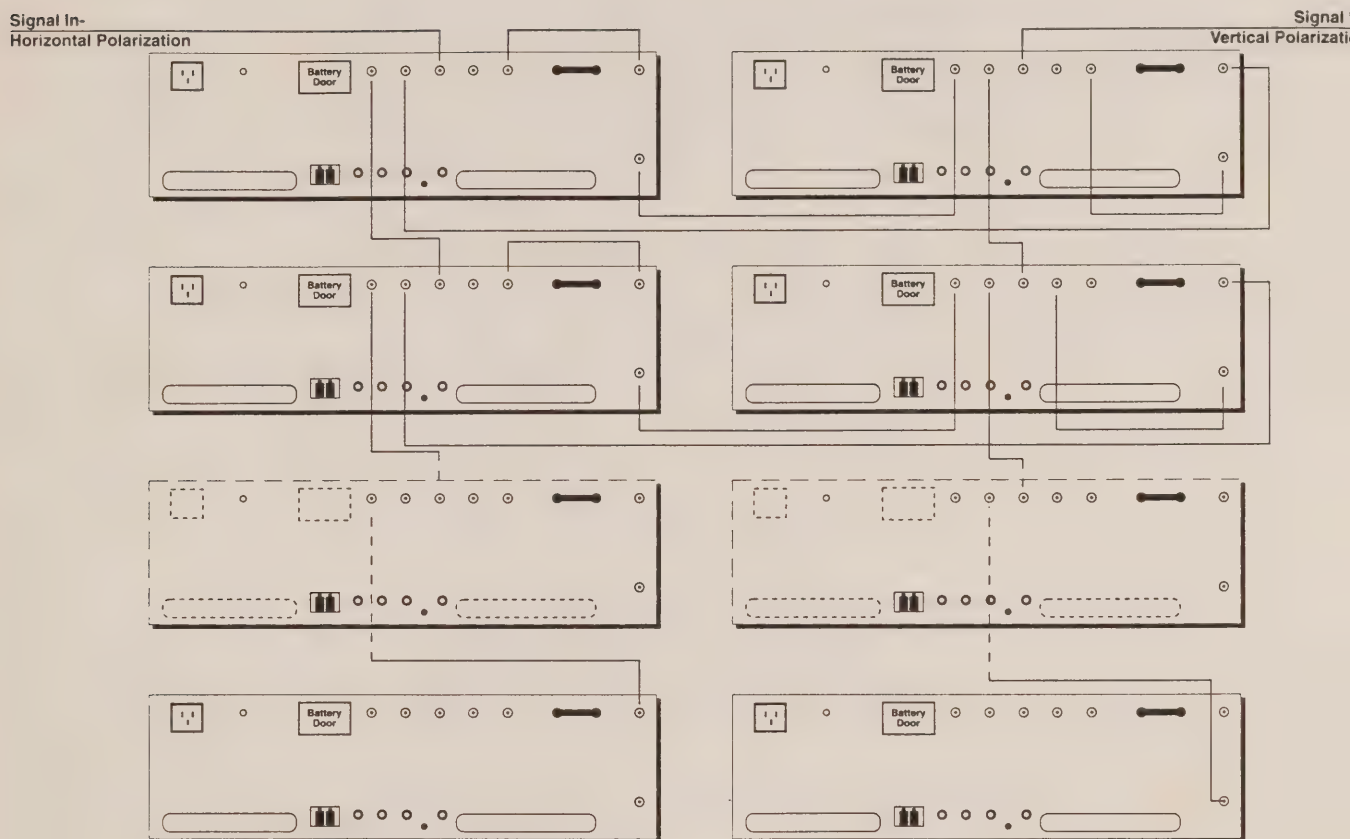


Figure 2-2: Multiple Receiver Installation

Notes: IRD Port 0, Port 1 inputs will AC couple signal to ground when not active to improve receiver performance. When Port 0 is selected from front panel menu, Port 1 is grounded, and vice versa. Exercise caution when using external splitters and amplifiers.

IF Splitter provides best signal quality with 75 ohm termination on all outputs. IF Splitter output 4 is DC Coupled to the input to pass LNB power. Outputs 1, 2, 3 are DC blocked.

Changing Battery

The DigiCipher Decoder uses both an on-board and an external battery for backup memory power. The external battery can be replaced by a Ray-O-Vac part number 844, Radio Shack part number 23-174, or equivalent. This should be done at least annually.



CAUTION: Removal of the battery holder will allow access to voltage levels with a risk of electric shock. Therefore, the following instructions are for use by qualified electronics service personnel only. To reduce the risk of electric shock, do not perform any servicing unless you are qualified to do so. Refer all servicing to qualified service personnel.

The DigiCipher Decoder battery is located on a sliding battery holder on the back of the receiver. To minimize your risk of electric shock, be sure that the receiver is disconnected from its power source during battery replacement. Qualified personnel should follow this procedure:

1. Disconnect power to the IRD.
2. Remove screws and slide out battery holder.
3. Disconnect cable connector from battery. Remove battery which is attached by velcro to the battery holder.
4. Replace battery and reconnect to cable connector.
5. Slide battery holder back into unit and tighten screws.
6. Return power to unit.

Renewing Security

The IRD comes equipped with a renewable security slot concealed behind the front panel. If security needs to be “renewed”, General Instrument or your program provider will issue you a TvPass™ Card—resembling a consumer credit card—to insert into this slot. To access the security slot, do the following:

1. Unscrew the two screws on the far left side of the instrument front panel. (Refer to Figure 3-1 for the location of the security slot panel.)
2. Remove the left portion of the front panel. This will expose the TvPass Card security slot.
3. Insert your new security pass card into the slot. Follow instruction on or with the TvPass Card. Ensure that the proper end is inserted first with the top side up. Leave the card in place until a new card is issued.

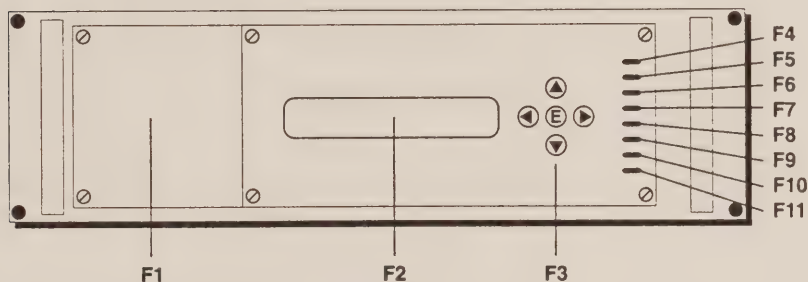
You may confirm proper connection of the TvPass Card by using the OSD. See Appendix C for OSD screen information. Note that the fifth field in line 1 of the diagnostic screen changes when the TvPass Card is inserted. Note also the ADDR menu on the front panel LCD will display the TvPass Card number.

4. Replace the paneling and screws.
5. Follow instructions with TvPass Card for obtaining mating messages from program providers.

Chapter 3

Operating the DSR-1500

All operations described in this chapter are performed through the IRD front panel. As illustrated in Figure 3-1, the front panel consists of a liquid crystal display (LCD), an operator's keypad, and several indicator lights. Concealed behind the left panel is a card slot that accepts the TvPass™ Card for renewing security addresses, as described in Chapter 2.



- F1. Access cover to TV pass card™ renewable security slot.
 F2. LCD display.
 F3. Keypad: Buttons are Left, Right, Up, Down, Enter.

Status LEDs

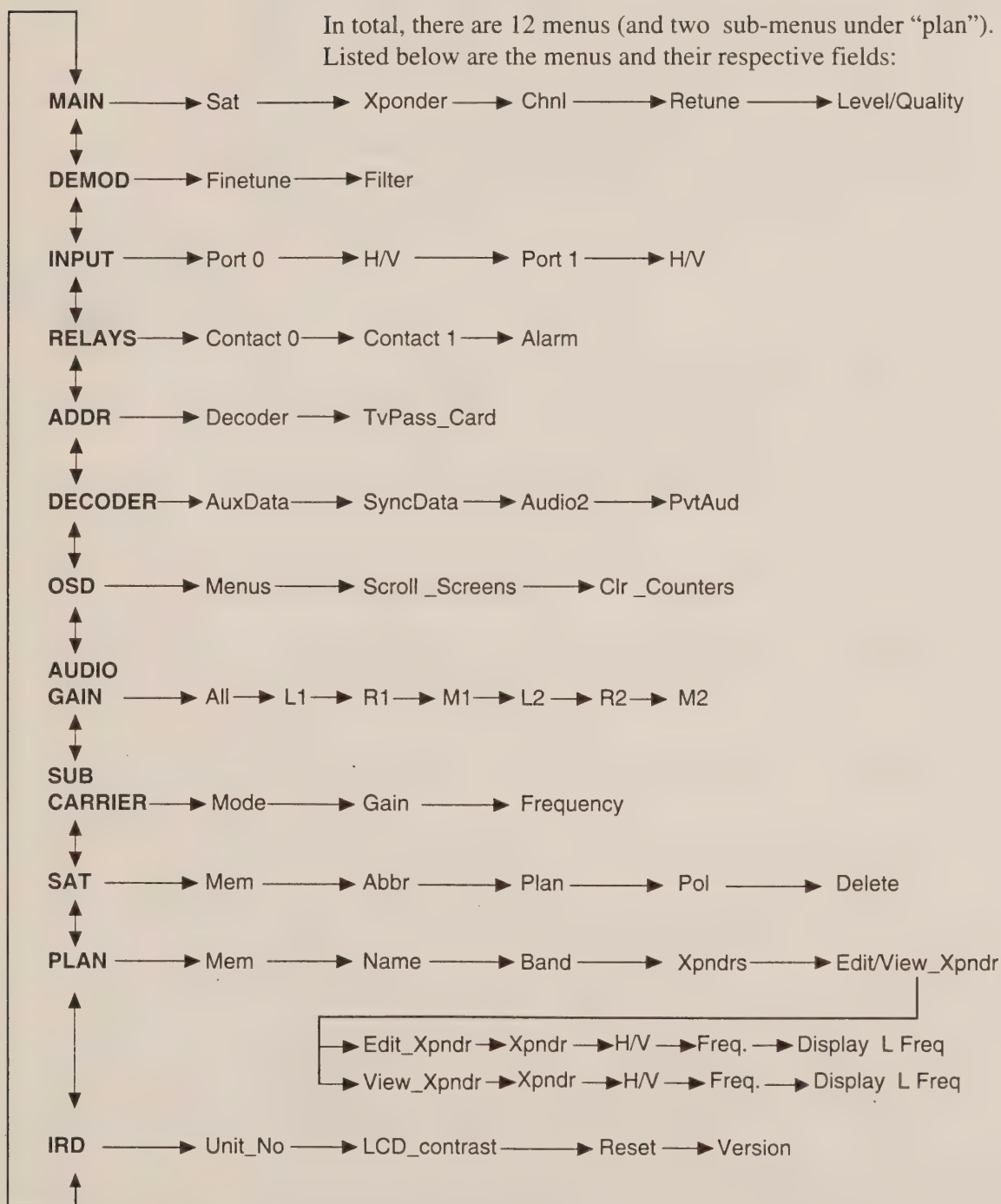
- F4. Authorized.
 F5. VideoCipher Sync.
 F6. DigiCipher Sync.
 F7. Manual Mode.
 F8. Port 0.
 F9. Port 1.
 F10. Contact 0 Energized.
 F11. Contact 1 Energized.

Figure 3-1: IRD Front Panel

Using the Front Panel

The IRD front panel LCD displays a system of menus that you can use to configure and control your satellite system. Using the up and down arrows from the operator's keypad, you can scroll through the menus to reach the function you desire. Use the right and left arrows to select the operating parameters.

In total, there are 12 menus (and two sub-menus under "plan"). Listed below are the menus and their respective fields:



The name of the current menu is always displayed in the upper left corner of the LCD. The remainder of the display shows status information, value fields, and/or instructions. Notice the arrow indicator displayed in the lower left corner of the LCD. At all menu locations, this indicator shows allowable keypad entries.

While most of the fields in the menus are alterable, a few are for display purposes only and can not be changed. These are indicated later in this chapter as each menu is described. If you try to select a menu item that is not alterable, the cursor will simply skip over it to the next alterable item.

The menu items that are changeable will be different, depending on receiver status. To assist you in determining which items are alterable and which are not alterable at this time, the items that are alterable are preceded with an arrow indicator on the top row of the LCD display.

Making Changes

While the options and fields vary from menu to menu, the procedure for changing data is the same. Before you begin configuring your system for actual use, practice moving around the menus and using the operator's keypad. Once you're familiar with the menu structure, move on to the remaining sections in this chapter.

If you want to change a field in any given menu, and that field is alterable, do the following:

1. With the cursor in the far left position on the LCD, use the up and down arrows from the operator's keypad to scroll to the menu containing the field you want to change.
2. Use the left and right arrows to move to the field of choice.
3. Press the Enter key, "E". Notice that the cursor moves down over the data you want to replace.
4. Use the up and down arrows to scroll through the available options for this field.
5. Once you've found the option you desire, press the Enter key again to activate your selection.

Caution: Outputs to subscribers might be changed at this point. Review your selection to ensure accuracy.

6. Use the left and right arrows to return to the far left of the LCD next to the menu name.

The settings you made will be retained when the power is off, and will remain in effect the next time the IRD is turned on. To perform a global reset to factory defaults, see the IRD Menu, Reset function described later in this chapter.

Operating Modes (Retune)

The IRD operates in one of two modes: Manual (with retune disabled) or Automatic (with retune enabled). In the Automatic (retune-enabled) mode, the input channel and rear panel contact positions are selected automatically under control of a satellite downlink signal that includes blackout/retune control data.

In the Manual (retune-disabled) mode, the IRD is controlled strictly from the front panel using the keypad and LCD menu system. When the IRD is in the manual mode, the "Manual" indicator on the right of the front panel lights.

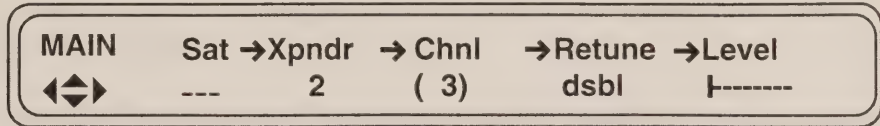
The IRD is in the Automatic mode if the Retune field in the MAIN Menu is enabled. In this case, the Manual LED on the front panel is not lit. When Retune is enabled, many other fields in other menus become inaccessible. While you can scroll through the menus to see the status of certain functions, your access to menu functions is limited until you return to manual mode by disabling Retune.

Note: If the IRD is put into Manual mode while a contact is energized, the contact will remain energized until it is manually de-energized, or until the unit is returned to Auto mode and the relay is de-energized by a remote command.

Menu Descriptions

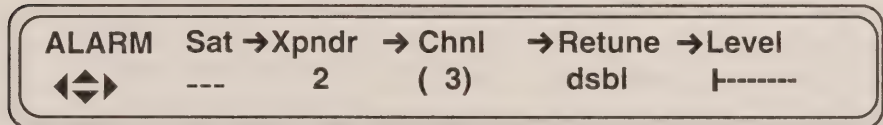
MAIN (ALARM)

The following sections describe in detail each of the menus, fields, and options displayed on the front panel LCD.



The MAIN Menu has four alterable fields and one unalterable field. The fields that you can alter include Xpndr (Transponder), Chnl (DigiCipher Channel), Retune, and Level. The Sat (Satellite) field is for display purposes only.

We strongly recommend that the unit be left with the MAIN Menu displayed when in normal operation: the basic operating conditions are displayed in this menu. Additionally, when the receiver senses a "no video out" condition, the Summary Alarm is activated. The "MAIN" will flash "Alarm" as shown below to assist the operator to determine which of several receivers is the unit in alarm status.



Sat

The Sat (Satellite) field displays the current satellite as selected by the SAT (Satellite) Menu and cannot be changed here.

Xpndr

The Xpndr (Transponder) field displays the currently selected transponder and is operator selected here. To change transponders, shift one field to the right using the right arrow key, and press Enter. Use the up and down arrows to scroll through the available transponders until you find the desired transponder. Options: Typically 1-24 or 1-32, but dependent on satellite selected.

Chnl

The Channel field displays the DigiCipher channel currently selected for this transponder. This field is user selected. This field is inactive when DigiCipher signal is not present.

To change DigiCipher channels, shift two fields to the right using the right arrow key, and press Enter. Use the up and down arrows to scroll through the available channels until you find the desired channel. Options: 1-15. (Not all channels used by each programmer.)

The number of channels defined by the program provider varies from transponder to transponder. The number of channels defined in a transponder may be greater than the number of channels carrying video information. Channels which are defined but not currently carrying video are indicated by parenthesis around the channel display.

Retune

The Retune field determines whether the IRD will operate in the Manual or Automatic Retune mode. Retune enabled indicates Automatic mode; Retune disabled indicates Manual mode. This field is user selected. **You will notice that many fields are not changeable when Retune is enabled.**

To switch the IRD from Manual to Automatic mode, or vice versa, shift three fields to the right using the right arrow key, and press Enter. Use the up and down arrows to select either enable or disable.
Options: enbl, dsbl.

Level [Quality]

The Level field provides an approximate gauge of signal strength. This field shows a bar graph representing the signal strength when clear FM and VCII PLUS formats are received and a quality index representing signal strength plus other factors when a DigiCipher format is received. See Appendix C, On Screen Diagnostic, line 8, for information on a more precise index of DigiCipher signals.

MAIN Press E to reduce graph size
Level: |||||.....

To assist installation and troubleshooting, an expanded Level [Quality] bar graph is available. From MAIN, press the right arrow until the cursor is on Level [Quality] and press Enter. To return to the normal display, press Enter again.

DEMOD

DEMOD →Finetune →Filter
↕ 0.00MHz (manual) 27MHz

The DEMOD Menu allows you to fine tune your satellite reception and select between 31 MHz, 27 MHz, and TI filters. Both fields in this menu can be altered.

Finetune

The Finetune field allows you to fine tune the current satellite offset in 250 kHz and 1 MHz increments.

To fine tune your satellite reception, shift one field to the right using the right arrow key, and press Enter. Use the up and down arrows to fine tune in 250 kHz increments, or press the left arrow key again to fine tune in 1 MHz increments.

When a DigiCipher signal is locked on (Sync) the Finetune field becomes "Auto" and is not changeable by the operator.

Filter

The Filter field allows you to select between 27 MHz, 31 MHz, and TI filters.

To select filters, shift two fields to the right using the right arrow key, and press Enter. Use the up and down arrows to scroll through the available filters until you find the filter you desire. Options: 27 MHz, 31 MHz, and TI.

Note: Use of the TI filter requires a good overall signal level. (The TI requires C/N of 12db or higher). Use of the filter with moderate to low signal strength will result in loss of video and audio.

INPUT

INPUT	→Port0_Sat	→H/V	→Port1_Sat	→H/V
↕	#32 AT3	V	#4 ---	H

The INPUT Menu allows you to assign the polarity of each port and the satellite to which the port should be connected. This menu has four fields that you can alter. You will notice that the currently active port cannot be changed with Retune enabled.

Port0_Sat

The Port0_Sat field lets you select a satellite from a predefined table and assign it to port 0.

To assign a satellite to port 0, shift one field to the right using the right arrow key, and press Enter. Use the up and down arrows to scroll through a current list of available satellites in the satellite table. Notice that while you are scrolling the satellite designation changes. When you find the desired satellite press Enter.

H/V

The first horizontal/vertical field lets you assign polarity to port 0. To assign polarity, shift two fields to the right using the right arrow key and press Enter. Use the up and down arrow key to select H for horizontal or V for vertical. Options: H, V.

Port1_Sat

The Port1_Sat field lets you select a satellite from a predefined table and assign it to port 1. This field operates the same as the Port0_Sat field.

H/V

The second horizontal/vertical field lets you assign polarity to port 1. This field operates the same as the first H/V field.

RELAYS

RELAYS ◀▶	→ Contact0 off	→ Contact1 off	Alarm alarm
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When retune is disabled, the RELAY Menu allows you to energize or de-energize the contact closures on the rear barrier strip. When Retune is enabled, the RELAY Menu is for display purposes only and network messages control the contacts. Use the MAIN menu to enable or disable Retune control. The relays and the summary alarm are all Form C contacts.

Contact0

The Contact0 field displays the current status of contact 0 on the rear panel.

To energize or de-energize contact 0, shift one field to the right using the right arrow key, and press Enter. Use the up and down arrows to select "on" or "off" depending on if you want the contact energized or de-energized. Options: on, off.

Contact1

The Contact1 field displays the current status of contact 1 on the rear panel.

To energize or de-energize contact 1, shift two fields to the right using the right arrow key, and press Enter. Use the up and down arrows to select "on" or "off" depending on if you want the contact energized or de-energized. Options: on, off.

Alarm

The Alarm field displays the status of the IRD Summary Alarm Contact. If "alarm" is displayed, the "alarm" contact is energized. The alarm is energized when the IRD fails to detect video signals on its

output. The presence of video from DigiCipher, VCII PLUS, or clear FM formats will prevent the alarm condition. The unit will typically be in the alarm condition until installation is completed.

Options: "alarm" or "off".

ADDR

ADDR	Decoder	TvPass_Card
◆	08000123	not inserted

The Address Menu is for display only.

Decoder

The DECODER electronic address is displayed in hexadecimal digits. This address is used by the program provider to identify your specific IRD for authorization and retune messages. The display enables you to see the address from the front panel rather than moving to the IRD rear panel to read the label. Options: any 8 hexadecimal digits [0 through F].

TvPass_Card

The TvPass Card electronic address is displayed in Octal when a card is installed. The IRD does not initially require a TvPass Card; if one is required, program providers will provide the Card. The TvPass Card address, if installed, and the Decoder address would both be used by the program provider to identify your specific IRD for authorization and retune messages. The display enables you to see the TvPass Card address from the front panel of the IRD. See Chapter 2, Renewing Security, for installation information. Options: "not inserted", "xxxxxxx" (your unique TvPass Card address), "xxxxxxx needs mating".

DECODER

DECODER	→AuxData	→SyncData	→Audio 2	→PvtAud
◀▶	(0)	(3)	Prim	Off

The DECODER Menu displays and selects what data is output from the receiver to the rear panel connectors.

AuxData

DigiCipher provides capability for 6 streams of 9600 Baud asynchronous data. One set of 3 streams is associated with the lower video channel numbers; one set of 3 is associated with the upper video channel numbers. Contact your data/program provider for information on which video channel(s) and data channel to select. Range: 0, 1, 2.

SyncData

DigiCipher provides for 253 synchronous data streams per transponder when established by the program supplier. Contact your data/program provider for information. Range 3-255.

Audio 2

The Audio 2 field lets you select the material to be output on Left 2, Mono 2, Right 2 "Secondary Audio" terminals on the rear panel. The "Prim" (Primary Audio Pair) outputs Left 1, Mono 1, Right 1 on L2, M2, R2. The "SAP" (Secondary Audio Program) causes the secondary audio program to be put onto L2, M2, R2 when the programmer provides SAP; when no SAP is provided by the programmer, L2, M2, R2 revert to primary outputs. In VCII PLUS mode, no output is available on L2, M2, R2.

PvtAud

When you select Private Audio "on", the L2, M2, R2 outputs are changed from "Prim" or "SAP" to another set of audio channels available only to commercial receivers. The program provider may configure his system to provide, for example, another set of stereo audio, messages, or control tones. Contact providers for information.

OSD

OSD → Menus → Scroll screens → Clr_counters
 ⬅ ➡ on ⬅ ➡

The On-Screen Diagnostics Menu allows you to display DigiCipher Decoder diagnostic information on your television monitor through the rear panel "NTSC OSD" output. When the OSD Menu field is on, the Scroll-screens and Clr-counters fields appear. These allow you to scroll between diagnostic screens and clear all system counters.

Note: We recommend that menus remain "off" unless in actual use to minimize the possibility of bleed-through to "NTSC NO OSD" out.

Menus

The Menus field enables or disables the On Screen Diagnostic function for the IRD. To enable or disable OSD, shift one field over to the right using the right arrow key, and press Enter. Use the up and down arrow keys to toggle between "on" and "off." Notice that when this field is toggled "on," two additional fields appear.

Scroll_screens

The Scroll_screens field is enabled when the OSD Menus field is enabled. To scroll through a tier of diagnostic screens on your television monitor, shift two fields over to the right using the right arrow key, and press Enter. Then use the right and left arrows to scroll to the screen of choice. Refer to Appendix C of this manual for a description of possible diagnostic output and its definition.

Clr_counters

The Clr-counters field is enabled when the OSD Menus field is enabled. It lets you reset DigiCipher Decoder counters. To clear counters, shift three fields over to the right using the right arrow key, and press Enter. Notice on the OSD that many counters reset to zero and begin counting again. (Refer to appendix C, OSD screen Line 8).

AUDIO_GAIN

AUDIO_GAIN	→All	→L1	→R1	→M1	→L2	→R2	→M2
◀▶	dB	0	0	0	0	0	0

The AUDIO_GAIN Menu allows you to adjust the output level of the audio signal in 2 dB increments. You can adjust all levels simultaneously using the All field or you can adjust one level at a time. Both primary and secondary audio are displayed.

All

The All field lets you adjust the output level of all the audio signals at one time. To do this, shift one field over to the right using the right arrow key, and press Enter. Notice that a right arrow appears in the field. This tells you that all adjustments you make will affect the signals to the right. Use the up and down arrow keys to adjust the output level as desired.

